REMARKS

Applicant has cancelled claims 1-4, 9, 10, 18-24, 27-36 and 39 of the present application and amended claims 5-8, 11-17, 25, 26, 37 and 38. With respect to claims 7, 8, 11-17, 25, 26, 37 and 38, Applicant has amended these claims to include all of the limitations of the base claims from which these claims originally depended together with the limitations of any intervening claims. In the Office Action, the Examiner indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. As such, Applicant respectfully believes that these claims are allowable in their present form and requests the Examiner to issue an indication of such.

Applicant has amended the specification of the application for clarity purposes only. The amendment to the specification was made to correct an error in the translation of the application. No new matter has been added to the specification based on this amendment.

Applicant has also amended the claims of the present application by removing the term "frame-synchronize-information" and replacing it with the term "frame number". This amendment was made for clarification purposes only and Applicant does not believe that this amendment should affect the allowability of any of the amended claims.

The Examiner rejected claims 5 and 6 of the present application under 35 U.S.C. §102(e) as being anticipated by Sekine et al. (U.S. Patent No. 6,259,683). With respect to claim 5, in Sekine et al. the time stamp information is used to ensure identity of data between the two base stations (hereinafter referred to as the source base station and target base station) when a soft handover is executed. *See* Column 4 and 5, page 12 of reference. A clock is generated at MCC and transmitted to MS. A BTS refers to the clock so that synchronization of frames between MCC and MS can be realized. The source base station delays transmission a certain amount of time so that a timing of transmission by the source base station coincides with that by the target base station. A "delay" used in the reference means the above certain amount of time. Applicant's presently claimed invention differs in the use of a frame number, differs in the use of an estimated delay time and differs in the objective.

In the reference, an ID code (time stamp) is added to data which is made in a way that a frame is divided into a short period (unit time). This time stamp represents elapsed time within a frame and is reset every frame (cf. column 7, page 7 of the reference). In other words, the object is to synchronize on the unit time basis within a frame. The reference does not disclose, teach or suggest a "frame number" at all. In the present invention, a frame number is added to every frame to synchronize on a frame basis.

In the present invention, a frame number is added on the basis of an estimated delay time. For example, as shown in Fig. 36, in a system of the present invention both a transmitter

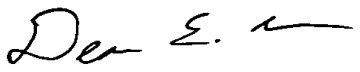
(DHT) and a receiver (BTS) generates a radio frame clock. When numbering frame numbers, estimation of delay time between the transmitter and receiver is made, thereby allowing deviation of timing of extraction of frames by the receiver. The cited reference does not mention estimated delay time.

In the reference cited by the Examiner, when a soft handover is excuted, an ID code (time stamp) is used to ensure the identity of data between a source base station and a target base station, in other words, to synchronize timings of transmission made by the base stations. Specifically, the source base station sends ID numbers to be transmitted to the target base station. On the other hand, in the presently claimed invention frame numbers are generated and added in view of the difference of estimated delay time. This difference is ascribed to difference in distances between base stations and MCC or differences in types of service, for example. For all the reasons set forth above, Applicant respectfully requests the Examiner to withdraw the rejection of independent claim 5.

With respect to amended independent claim 6, the reference discloses the use of identification numbers but does not disclose use of an estimated delay time. In the presently claimed invention, frame numbers and an estimated delay time is used in synchronizing frames. As such, since the cited reference does not disclose, teach or suggest the use of frame numbers and estimated delays it does not anticipate the presently claimed invention. Applicant respectfully requests the Examiner to withdraw the rejection of independent claim 6 as Sekine et al. does not anticipate the presently claimed invention.

Applicant believes that all of the pending claims of the present application are allowable in their present form and respectfully requests the Examiner to issue a Notice of Allowance so indicating.

Respectfully submitted,



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Version with Markings to Show Changes Made

In the specification:

--The outline of steps necessary for downlink FN slide processing will be given with reference to Fig. 36. In Fig. 36 it is assumed that the synchronization phase difference between frames through diversity handover trunk 34 and those through BS2 is 0. BS 4 handles frames which have a synchronization phase difference from those handled by diversity handover trunk 34, and thus the reference clock of BS 4 is by one clock unit (OFS) behind the corresponding reference clock of BS 2. It is further assumed that the maximal fluctuation delay frames may undergo during the passage from diversity handover trunk 34 to BS is 38 msec (being equal to [2]3 [line] radio frame clocks (FN) + 13 clock units (OFS)), being the same for BS 2 and BS 4.--

In the claims:

5. (Amended) A frame transmitting device [according to claim 2,] comprising:

a frame number adder for adding a frame number to a frame; and

a transmitter for transmitting the frame with the frame number;

wherein the [frame-synchronize-information] frame number is determined according to an expected delay time of the frame.

6. (Amended) A frame receiving device [according to claim 3,] comprising:

a receiver for receiving a frame having a frame number; and

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number;

wherein the frame synchronizer executes the synchronization adjustment according to an expected delay time required for the frame to reach the frame synchronizer.

7. (Amended) A frame transmitting device [according to claim 5,] comprising:

a frame number adder for adding a frame number to a frame;

a transmitter for transmitting the frame with the frame number;

wherein the frame number is determined according to an expected delay time of the frame; and

wherein the expected delay time is equal to the sum of a [maximal] maximum delay time estimated for the frame, and an estimated [maximal] maximum phase difference between first and second clock pulses.

8. (Amended) A frame receiving device [according to claim 6,] comprising:

a receiver for receiving a frame having a frame number;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number;

wherein the frame synchronizer executes the synchronization adjustment according to an expected delay time required for the frame to reach the frame synchronizer; and

wherein the expected delay time is equal to the sum of a [maximal] maximum delay time estimated for the frame, and an estimated [maximal] maximum phase difference between first and second clock pulses.

11. (Amended) A frame transmitting device [according to claim 5,] comprising:

a frame number adder for adding a frame number to a frame;

a transmitter for transmitting the frame with the frame-synchronize-information;

wherein the frame number is determined according to an expected delay time of the frame; and

wherein, when a real delay time exceeds the expected delay time, the expected delay time is updated.

12. (Amended) A frame receiving device [according to claim 6,] comprising:

a receiver for receiving a frame having a frame number;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number;

wherein the frame synchronizer executes the synchronization adjustment according to an expected delay time required for the frame to reach the frame synchronizer; and

wherein, when a real delay time exceeds the expected delay time, the expected delay time is updated.

13. (Amended) A. frame communication system [according to claim 4, further] comprising:

a frame number adder for adding a frame number to a frame;

a transmitter for transmitting the frame including the frame number;

a receiver for receiving the frame from the transmitter;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number included in the frame;

a receiver side clock circuit which provides first clock pulses;

a transmitter side clock circuit which provides second clock pulses in synchronization with the same phase or a different phase with respect to the first clock pulses provided by the receiver side clock circuit;

wherein the frame number adder adds the frame number to the frames according to the first clock pulses, and the frame synchronizer executes the synchronization adjustment according to the second clock pulses;

a transmission control circuit which determines the frame[-synchronize-information] number according to a correction value; and

a reception control circuit which provides an alarm signal to the transmission control circuit when the reception control circuit finds that the frame synchronizer is unable to achieve the synchronization adjustment,

wherein, when the transmission control circuit receives the alarm signal, the transmission control circuit updates the correction value.

14. (Amended) A frame communication system [according to claim 13, further] comprising:

a frame number adder for adding a frame-synchronize-information to a frame;

a transmitter for transmitting the frame including the frame number;

a receiver for receiving the frame from the transmitter;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number included in the frame;

a receiver side clock circuit which provides first clock pulses;

a transmitter side clock circuit which provides second clock pulses in synchronization with the same phase or a different phase with respect to the first clock pulses provided by the receiver side clock circuit;

wherein the frame number adder adds the frame number to the frames according to the first clock pulses, and the frame synchronizer executes the synchronization adjustment according to the second clock pulses;

a transmission control circuit which determines the frame number according to a correction value;

a reception control circuit which provides an alarm signal to the transmission control circuit when the reception control circuit finds that the frame synchronizer is unable to achieve the synchronization adjustment,

wherein, when the transmission control circuit receives the alarm signal, the transmission control circuit updates the correction value;

at least one other frame[-synchronize-information] number adder; and

a selection circuit which selects one frame from the frames provided by the plurality of frame[-synchronize-information] number adders, and provides the selected frame to the frame synchronizer.

15. (Amended) A. frame communication system [according to claim 14, further] comprising:

a frame number adder for adding a frame number to a frame;

a transmitter for transmitting the frame including the frame number;

a receiver for receiving the frame from the transmitter;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number included in the frame;

a receiver side clock circuit which provides first clock pulses;

a transmitter side clock circuit which provides second clock pulses in synchronization with the same phase or a different phase with respect to the first clock pulses provided by the receiver side clock circuit;

wherein the frame number adder adds the frame number to the frames according to the first clock pulses, and the frame synchronizer executes the synchronization adjustment according to the second clock pulses;

a transmission control circuit which determines the frame number according to a correction value;

a reception control circuit which provides an alarm signal to the transmission control circuit when the reception control circuit finds that the frame synchronizer is unable to achieve the synchronization adjustment,

wherein, when the transmission control circuit receives the alarm signal, the transmission control circuit updates the correction value;

at least one other frame number adder;

a selection circuit which selects one frame from the frames provided by the plurality of frame number adders, and provides the selected frame to the frame synchronizer;

a combining circuit;

wherein the frame synchronizer executes synchronization adjustment of the plurality of frames provided by the frame[-synchronize-information] number adders, and the combining circuit combines the adjusted frames into one frame.

16. (Amended) A. frame communication system [according to claim 14, further] comprising:

a frame number adder for adding a frame number to a frame;

a transmitter for transmitting the frame including the frame-number;

a receiver for receiving the frame from the transmitter;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number included in the frame;

a receiver side clock circuit which provides first clock pulses;

a transmitter side clock circuit which provides second clock pulses in synchronization with the same phase or a different phase with respect to the first clock pulses provided by the receiver side clock circuit;

wherein the frame number adder adds the frame-synchronize-information to the frames according to the first clock pulses, and the frame synchronizer executes the synchronization adjustment according to the second clock pulses;

a transmission control circuit which determines the frame number according to a correction value;

a reception control circuit which provides an alarm signal to the transmission control circuit when the reception control circuit finds that the frame synchronizer is unable to achieve the synchronization adjustment,

wherein, when the transmission control circuit receives the alarm signal, the transmission control circuit updates the correction value;

at least one other frame number adder;

a selection circuit which selects one frame from the frames provided by the plurality of frame number adders, and provides the selected frame to the frame synchronizer; and

further characterized in that the selection circuit selects one frame based on any information[s] included in the frames.

17. (Amended) A. frame communication system [according to claim 1, further] comprising:

a frame number adder for adding a frame number to a frame;

a transmitter for transmitting the frame including the frame number;

a receiver for receiving the frame from the transmitter;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number included in the frame;

a copying means which copies a frame with the frame[-synchronize-information] number, thereby creating a plurality of frames;

a plurality of physical or logical transmission routes which transmit the frames separately;

a plurality of radio transmitters which transmit the plurality of frames transmitted through the transmission routes, at timings determined by the frame[-synchronize-information] number attached thereto; and

a plurality of terminals to receive in a diversity manner the frames transmitted from the radio transmitters.

25. (Amended) A frame receiving device [according to claim 6,] comprising:

a receiver for receiving a frame accompanying with a frame number;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number;

wherein the frame synchronizer executes the synchronization adjustment according to an expected delay time required for the frame to reach the frame synchronizer; and

wherein the expected delay time is determined according to a difference in timing between the frame[-synchronize-information] number attached to a frame received in the past, and an actual time of reception of the same frame.

26. (Amended) A frame receiving device [according to claim 25,] comprising:

a receiver for receiving a frame accompanying with a frame number;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number;

wherein the frame synchronizer executes the synchronization adjustment according to an expected delay time required for the frame to reach the frame synchronizer;

wherein the expected delay time is determined according to a difference in timing between the frame number attached to a frame received in the past, and an actual time of reception of the same frame; and

wherein the expected delay time is determined by obtaining a difference in timing between the frame[-synchronize-information] number attached to a frame received in the past, and an actual time of reception of the same frame, and by adding a predetermined safety factor to the difference.

37. (Amended) A frame transmitting device [according to claim 11,] comprising:

a frame number adder for adding a frame number to a frame; and

a transmitter for transmitting the frame with the frame number;

wherein the frame number is determined according to an expected delay time of the frame;

wherein, when a real delay time exceeds the expected delay time, the expected delay time is updated; and

wherein a time length introduced for updating the expected delay time is constant regardless of an overtime of a real delay time exceeding the expected delay time.

38. A frame receiving device [according to claim 12,] comprising:

a receiver for receiving a frame accompanying with a frame number;

a frame synchronizer for executing a frame synchronization adjustment referring to the frame number;

wherein the frame synchronizer executes the synchronization adjustment according to an expected delay time required for the frame to reach the frame synchronizer;

wherein, when a real delay time exceeds the expected delay time, the expected delay time is updated; and

wherein a time length introduced for updating the expected delay time is constant regardless of an overtime of a real delay time exceeding the expected delay time.